Online Experiments with jsPsych

Introduction to jsPsych

January 18, 2021

jsPsych

- What is jsPsych?
  - JavaScript library for running experiments in the browser
- Useful links
  - jsPsych Website
  - jsPsych Code
  - jsPsych Paper
  - YouTube Tutorial 1
  - YouTube Tutorial 2
  - YouTube Tutorial 3

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- Running behavioural studies online: Is it valid?
- Useful references
  - Bridges, D., Pitiot, A., MacAskill, M. R., & Peirce, J. W. (2020). The timing mega-study: comparing a range of experiment generators, both lab-based and online. PeerJ, 8, e9414.
  - de Leeuw, Joshua R., and Benjamin A. Motz. "Psychophysics in a Web browser? Comparing response times collected with JavaScript and Psychophysics Toolbox in a visual search task." Behavior Research Methods 48.1 (2016): 1-12.
  - Hilbig, B. E. (2016). Reaction time effects in lab-versus Web-based research: Experimental evidence. Behavior Research Methods, 48(4), 1718-1724.

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- Advantages
  - Late 2020/early 2021 only option for data collection! (Covid-19)
  - Very quick way to collect many participants
  - Access different population pools (e.g., age, native language)
    - Mechanical Turk/Prolific

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- What do we need?
  - Text Editor (Vim, VS Code, Sublime Text, R-Studio etc.)
    - Need to edit .js (95%), .html, and .css files
    - Syntax highlighting!
  - Web-Browser
    - Need to test on most commonly used browsers (e.g., Firefox, Chrome, and Safari)
  - jsPsych library
  - Web Server (e.g., Pavlovia)
    - Not required for local development/initial testing
  - Git (required for interaction with Pavlovia + useful in general for code development)
    - Git link

Git

- What is Git?
  - Git is version control software
    - We can use it to keep track of changes in our experiment code (complete history of changes)
    - Avoid need for myexperiment180121.js, myexperiment190121_test_change.js, myexperiment190121_other_change.js, and so on
    - Makes collaboration easier (share code, use code from others)
- What is GitHub/GitLab
  - Two separate online hosts for Git projects
    - GitHub
    - GitLab

Git Basics: Walk-through I

- Create a new project (local computer)
  - README.md file
  - git init . directory
  - git add .
  - git status
  - git commit
- Create a repository on GitHub[1] or GitLab
  - Your account → Your repositories → New
  - Repository name → Create repository
  - Option → . . . or push an existing repository from the command line

[1] Instructions refer to GitHub

Git Basics: Walk-through II

- Upload our local repository to GitHub or GitLab
  - git remote add origin https://github.com/igmmgi/XXX.git
  - git branch -M main[2]
  - git push -u origin main
- Locate project to clone (on GitHub/GitLab)
  - Code → Copy/Paste
- Clone an existing project (local computer)
  - git clone XXX
  - git log
- Clone TuebingenWorkshopOnlineExperiments which contains the course materials
  - git clone https://github.com/igmmgi/TuebingenWorkshopOnlineExperiments.git
  - git pull

[2] master to main name change 2020/2021

jsPsych: Getting Started

- Three related technologies
  - HTML (Hypertext Markup Language) with file extension .html
    - Controls the content on the webpage
  - CSS (Cascading Style Sheets) with file extendion .css
    - Controls the style on the webpage
  - JavaScript with file extension .js
    - Used to add some interaction

HTML + CSS + javascript

- Useful resources
  - w3schools.com (HTML)
  - w3schools.com (CSS)
  - w3schools.com (javascript)
- Demo Files
  - example.html
  - example_with_inline_css.html
  - example_with_spearate_css_file.html and example.css
  - example_with_javascript.html

jsPsych basics

- Combination of javascript, html, css
- Specific high-level code for behavioural experiments
  - Present text/images/sounds/movies
  - Record key-presses, reaction times, slider responses etc.
  - Organise data
  - Randomisation procedures
- Built around the idea pre-defined trial-types or plugins
  - Easy to use
  - Requires very little actual coding
  - Covers a wide-rage of use cases
  - We can also create custom plugins for more specific experiments (requires a little bit of coding)

jsPsych: A first "experiment"

- Demo Files
  - jspsych_exp1.html & jspsych_exp1.js
  - jspsych_exp2.html & jspsych_exp2.js
  - jspsych-6.2.0/examples/

jsPsych: Posner Task

- Files
  - TuebingenWorkshopOnlineExperiments/jsPsych/posner_task
- Walk-through ...